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ABSTRACT

This study examines the relationship between the amount of time sixth graders reported spending on homework and their achievement gains on the Iowa Test of Basic Skills (ITBS) between the spring of 1988 and the spring of 1989. Selected for participation were one or two classes in each of 30 public elementary schools in Chicago. Of the 30 schools, 10 were magnet schools, 10 integrated or desegregated schools, and 10 predominantly minority schools. The questionnaire administered in January, 1989 asked students how many days each week they were assigned homework in reading and language arts, mathematics, science, and social studies, and how much time they spent on assignments in each of these curriculum areas. The Chicago Board of Education's test score master file provided ITBS mathematics total and reading comprehension scores for April 1988 and 1989. Homework and achievement measures were average classroom level measures for the 52 surveyed classes, not individual student level measures. Although the findings strongly suggest that homework may be related to achievement gain in some classes, because of several methodological and measurement characteristics, the study fails to add unequivocal evidence to the discussion on the effectiveness of homework in the sixth grade curriculum. (RH)

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Achievement Effects of Homework in Sixth Grade Classrooms

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Because homework is an alterable variable that may have powerful effects on student achievement, it is a topic that deserves careful scrutiny. This study examines the relationship between the amount of homework time reported by sixth grade students in a January 1989 survey and their achievement gains on the Iowa Test of Basic Skills (ITBS) between the spring of 1988 and the spring of 1989. This study is the follow-up of a previous study that examined the difference in the amount of time spent on homework in three different types of elementary schools (magnet schools, integrated schools, and predominantly minority schools) in the Chicago Public School system (Easton and Bennett, 1990). That study found major differences between types of schools in the amount of time that students reported spending on homework. These differences were related to the background characteristics (prior achievement and income level of students) of the schools in the sample. Students in integrated schools reported more homework time than students in predominantly minority schools for math, science and social studies, but not in reading. Students in predominantly minority schools reported the least amount of homework time, especially in social studies and math. Students in both lower income and lower achieving schools reported less time spent on homework in social studies and math than students in higher income and higher achieving schools.

Homework is generally credited with increasing student achievement. What Works, (1986), a U.S. Department of Education review of educational research findings, includes homework among approximately 18 classroom level variables that have consistently produced stable positive results. Paschal, Weinstein & Walberg (1985) estimate that homework assigned without teacher feedback can move an average student from the median of an achievement distribution to the 60th percentile. When the teacher grades and makes

comments on homework, the effects can be even greater, raising the average student's performance to the 79th percentile. The Paschal et al. meta-analysis of 15 studies made 81 comparisons between classrooms with different amounts and types of homework. Of these, 85% had higher achievement results in the groups with more homework. A large-scale survey (Keith, 1982) of high school students provided evidence that homework has a compensatory effect, enabling lower ability students to perform as well or better than higher ability students if they complete more homework. Summary findings from a more recent review of homework literature in elementary and secondary schools suggest that the positive effects of homework are strongest for high school students, less strong at the junior high school level, and possibly negligible for upper elementary students (Cooper, 1989).

PROCEDURES

This study selected 30 Chicago Public elementary schools--10 magnet schools from a total of about 35, 10 integrated or desegregated schools from a total of about 80, and 10 predominantly minority schools from a subset of 82 predominantly minority schools that participated in a school improvement project. The random selection technique that created this sample of schools stratified the three subpopulations by geographic location to insure an accurate representation of school and student background characteristics. Most schools in all three groups had two regular (not including special education or bilingual) sixth grade classrooms, although two or three schools in each group had only one. In the two schools that had more than two sixth grade rooms, the investigators requested the principal to select

two typical rooms. The total sample included 30 schools with 52 sixth grade classrooms and 1,330 students.

TABLE 1 - CHARACTERISTICS OF SAMPLE SCHOOLS

	Integrated	Predominantly Minority	Magnet
# of Schools	10	10	10
Average membership	586	569	712
Median free lunch	27%	98%	49%
Racial Composition			
% White	51.2%	1.3%	21.3%
% Black	14.8%	81.8%	45.7%
% Hispanic	20.5%	16.8%	26.9%
% Other	13.5%	0.2%	6.1%
Sample			
# of Classrooms	17	18	17
# of Students	444	429	457

Researchers made early morning visits to schools in January 1989 and administered a questionnaire after classroom startup activities. The questionnaire asked students two questions: how many days each week they usually had homework in reading/language arts, math, science and social studies; and how much time they usually spent on assignments in each of the four subjects. Students indicated their school name and room number but not their own name or identification number.

For the data analysis, the first question was coded from zero to five days. For the second question, students responded either none, 1 to 15 minutes, 15 to 30 minutes, 30 to 45 minutes, or more than 45 minutes. These responses were transformed to numeric responses by using the midpoint of each response interval. A variable representing total

responses by using the midpoint of each response interval. A variable representing total time spent on homework each week for each subject was calculated by multiplying responses to the first question by responses to the second question.

The Chicago Board of Education test score master file provided ITBS mathematics total and reading comprehension scores for April 1988 and April 1989. The master file, arranged by school and room within school, contains individual student scores for several years. We matched 1988 and 1989 test scores and retained those records that had complete test scores for both years. This study uses 1988 classroom grade equivalent (GE) averages for 1988 and 1989 for students who had valid test scores in both years in reading comprehension and mathematics total. The homework and achievement measures are average classroom level measures for the 52 surveyed classrooms and not individual student level measures.

RESULTS

Table 2 contains the correlations between homework, 1988 and 1989 ITBS scores, and the gains between 1988 and 1989, for reading and math. (All test scores are in grade equivalent units.) Correlations between homework in reading and reading test scores in 1988 and 1989 are close to zero, showing no relationship between the average amount of reading homework in these 52 sixth grade classrooms and their ITBS scores in both 1988 and 1989. (The 1988 scores are fifth grade scores for the students and the 1989 scores are from the sixth grade testing.) In mathematics, the correlation between homework and test

scores is .25 for both 1988 and 1989, indicating a slight relationship between the average amount of time that classrooms spent on math homework during the 1988-89 school year and their average math test scores for 1988 and 1989. Table 2 also provides a correlation between amount of homework in both reading and math and test score gains between 1988 and 1989, showing slight positive correlations between amount of homework and achievement gain in both reading and math.

Table 2
Correlations Among Reading Homework and Achievement Measures
In all 52 Sampled Classrooms

	READING				MATH			
	HW	GAIN	88S	89S	HW	GAIN	88S	89S
Homework (HW)	1.00				1.00			
Gain (GAIN)	0.11	1.00			0.12	1.00		
1988 score (88S)	0.00	0.34	1.00		0.25	0.39	1.00	
1989 score (89S)	0.03	0.54	0.97	1.00	0.25	0.64	0.95	1.00
$\bar{X}$ =	81.9	0.90	5.71	6.61	101.7	1.07	5.92	6.99
SD =	32.5	0.28	0.95	1.06	27.3	0.27	0.71	0.85

Because of the likelihood that amount of homework and 1988 test scores influenced each other in affecting 1989 test scores, we used a regression model to test the effects of homework and the homework by 1988 test score interaction. (1988 and 1989 test scores are extremely highly correlated--.97 for reading and .95 for math. Little variance remains to be associated with other variables.) In reading, 1988 test scores, homework by 1988 test scores

and homework produce a multiple R of .976, accounting for 95 percent of the variability in 1989 reading test scores. In math, 1988 test scores, homework by 1989 test scores and homework produce a multiple R of .956, accounting for 91 percent of the variability in 1989

Table 3
Regression Equations

In reading, 89S = 1.117 + 0.948(88S) + .002(HW*88S) - 0.009(HW)

In math, 89S = -0.69 + 1.289 (88S) -0.001(HW*88S) + 0.009(HW)

math test scores. In both of these equations the two terms involving homework (homework and the interaction between homework and 1988 test scores) are not statistically significant because of the high correlation between the 1988 and 1989 test scores. The standard error of estimate is 0.241 (in grade equivalent units) in reading and 0.258 in math.

The regression equation for reading indicates that additional amounts of homework had a greater positive effect on 1989 scores in classrooms with higher 1988 test scores. In the classrooms with the very lowest 1988 scores, additional reading homework had no effect, that is, classrooms with very little homework had about the same 1989 scores as classes with high amounts of homework. However, in the classrooms with higher 1988 scores, additional homework is associated with greater 1989 test scores. For reading, additional homework begins to have a positive effect on 1989 scores in classrooms with 1988 scores of 4.7 and greater. (The average 1988 reading score in this sample is 5.71.) The higher the 1988 score, the greater difference in 1989 scores between classes with little homework and those reporting greater amounts.

For math, additional homework was always associated with higher 1989 test scores. However, more homework had a greater effect in classrooms with **lower** 1988 scores than in classrooms with higher 1988 scores. This is the opposite of what occurred in reading.

These results suggest that the amount of homework that students report completing has differential effects depending on subject matter and initial achievement status. In reading, a greater amount of homework is more strongly associated with higher 1989 test scores in classrooms with higher 1988 test scores than in classrooms with lower 1988 scores. In math, more homework had stronger positive effects in classrooms with lower 1988 scores.

DISCUSSION

Because of several methodological and measurement issues, this study fails to add unequivocal evidence to the discussion about the effectiveness of homework in the sixth grade curriculum. Although the results strongly suggest that homework may be related to achievement gain in some classrooms, we have no evidence to suggest why these findings may hold true. Although the measurement of homework (student questionnaire responses) used here proved adequate to our earlier research (Easton & Bennett, 1990) on differences among types of schools, it contained no homework "quality" information. More detailed information about what kind of homework students do and how the teacher responds to the homework is necessary for better understanding of how homework affects student achievement, especially given the indication of the interaction between amount of homework and initial achievement levels.

Because grade equivalent scores were readily available, they provided the achievement measures in this study. Alternative metrics would probably have been more sensitive measures of change in this study.

Even though methodological issues may cloud the findings of this study, homework will continue to be an important component of the instructional program in Chicago Public Schools. The Chicago School Reform Act (Illinois Public Act 85-1418) has shifted authority and responsibility for much educational policy away from the central administration to the individual schools. All schools will be planning educational policies and programs that best suit their own needs in order to improve educational outcomes. The relationships among instructional goals and objectives, instructional techniques and homework should be carefully considered when schools develop their improvement plans.

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